JVIB

October 2005 • Volume 99 • Number 10

Practice Report

Street Crossings: Analyzing Risks, Developing Strategies, and Making Decisions

Dona Sauerburger

This report proposes an approach to teaching street crossing to students who are visually impaired that considers the risks, ambiguity, and complexity of today's intersections. Thirty or 40 years ago, street crossing was a straightforward task for travelers with visual impairments (that is, those who are blind or have low vision). The intersections were predictable, and there were standard, highly successful procedures using reliable vehicular sounds for crossing them safely (Jacobson, 1993; LaGrow & Weessies, 1994). Of course, there was risk in crossing, as there is risk in everything we do, but the risk was manageable and was considered acceptable if the proper procedures were followed.

Today, the task of crossing streets is complex. Intersections and traffic signals are unpredictable (Barlow, Franck, Bentzen, & Sauerburger, 2001), right-turn-on-red and other features require adaptations to the standard street-crossing procedure (Sauerburger, 1998), cars are quieter, and vehicular sounds are no longer reliably present (Barlow, Bentzen, & Tabor, 2003; Bentzen, Barlow, & Franck, 2000; Carroll & Bentzen, 1999; Sauerburger, 1989, 1995, 1999). The population of independent travelers with visual

impairments who cross streets now includes people with additional considerations (such as elderly people; children; and people with cognitive, mobility, and/or hearing disabilities in addition to visual impairment) that require adaptations to the standard street-crossing techniques,.

As a result, the questions of how and where to cross and even whether it is possible to cross a given street safely come up more and more frequently. The ambiguity and complexity in street crossing today requires an approach to teaching street crossing that addresses such questions. This report presents an approach that seems to address these issues satisfactorily.

In the approach presented here, after the student has learned all the requisite street-crossing concepts and skills, the following procedure is used to negotiate street crossings:

1. Analyze the situation (geometry and traffic control).

2. Determine how and when to cross if it is possible to do so (choose crossing strategy).

3. Determine the risks of crossing with the chosen strategy.

4. Reduce risks as much as possible.

5. Decide if the risks are acceptable.

6. Consider alternatives if the risks are not acceptable.

Steps 1 and 2 are no different from what has been taught for decades (Jacobson, 1993; LaGrow & Weessies, 1994). Where this approach to teaching street crossings diverges is in Steps 3-6, so these steps are addressed in more detail.

Determine the risks of crossing

In this step, the orientation and mobility (O&M) instructor and student consider what may go wrong during the crossing--they assess what kinds of risks exist. At all intersections, the increasing number of quiet cars available in the marketplace increases the likelihood that vehicles will approach or be present without being sufficiently audible. Some of the risks that are typical for different types of intersections are listed next.

Risks at intersections with traffic signals

At intersections with traffic signals, there are risks from

- Parallel traffic turning left into the crosswalk.
- Parallel traffic turning right into the crosswalk.
- Perpendicular right-turn-on-red traffic crossing or blocking the crosswalk.
- Vehicles running the red light from the perpendicular street.

Risks when crossing streets with stop signs

At intersections with two-way stop signs, there are risks from

- Traffic turning into the crosswalk from the parallel street.
- Traffic approaching or waiting at the stop sign on the street you are crossing.

- Traffic coming across the intersection from the other stop sign on the perpendicular street.

At intersections with four-way stop signs, there are risks from

- Stopped cars that surge forward and cross your path from any direction.
- Idling vehicles that are not audible.

Risks at uncontrolled crossings

When an individual crosses a street that has no stop sign or traffic signal (such as when crossing the main street where the only stop signs are for the parallel streets or when crossing separate right-turn lanes and roundabouts), there are negligible risks if one is crossing during a gap in traffic that is long enough for one to complete the crossing. The problem is that there are situations in which it is not possible to hear or see approaching traffic far enough in advance to know if the gap will be long enough to cross. If the individual intends to cross in these situations, there are risks that

- Undetected vehicles are approaching that can reach the pedestrian during the crossing.
- Drivers will fail to stop or yield if the pedestrian intends to rely on drivers to see and avoid him or her.

Reduce risks as much as possible

Once the potential dangers have been identified, the student and instructor brainstorm to come up with strategies to reduce the risks. Some ideas are listed here. Notice that strategies that reduce the risk of one danger sometimes

increase the risk of other dangers. When planning the risk-reducing strategies to be used, instructors need to consider which dangers are more risky and which dangers have risks that can be increased in order to reduce the risk of other dangers.

Sometimes, when individuals who are visually impaired consider the risks of crossing as planned, they realize that their original crossing strategy may be riskier than another, and they change crossing strategies. For example, one man who planned to cross facing north at a signalized intersection with the parallel street on his right decided to cross with the first surge of the parallel traffic. However, the first movement of traffic was the northbound traffic, which was allowed to go straight or turn left into his crosswalk. When he realized that crossing with the parallel traffic meant that he would cross when left-turning traffic had the legal right of way and the drivers were aggressively crossing his path, he decided to wait and cross when the parallel traffic in the lanes nearest to him began to move. This strategy (crossing with traffic in the nearest parallel lanes) is often effective for eliminating the danger of crossing against left-turning traffic, which has the legal right-of-way (Frieswyk, 2005).

A factor that is not listed among the following strategies but is important to consider is that travelers who have functional vision can reduce the risks significantly by scanning appropriately before and during the crossing (Sauerburger, 2003).

Strategies for reducing risks at signalized intersections

For parallel traffic that is turning left into the crosswalk,

- Cross early in the cycle, when traffic in the nearest half of the parallel street forms a "platoon" with no gaps, so as to block any left-turning movement.

- Cross the intersection counterclockwise to get an early start to cross the half of the street that has left-turning movement.

For parallel traffic that is turning right into the crosswalk,

- Alert the driver (keep the cane close and move it only when you are ready to start crossing; then raise your hand to face the drivers in a gesture that indicates "stop!").

- Begin crossing early while the traffic is slow (an accessible pedestrian signal can indicate when the walk interval begins).

- Cross the intersection clockwise, so drivers can see you with your cane or dog approaching.

For perpendicular right-turn-on-red traffic that is crossing or blocking the crosswalk,

- When crossing counterclockwise, be cautious when starting to cross the last lane--drivers who intend to turn right on red may approach the crosswalk too fast to avoid pedestrians.

When crossing clockwise,

- Be aware that drivers are looking to their left, so they sometimes never even see you.

- Notice the position of the cars and do not cross if they

are edging forward or blocking the crosswalk.

- Be as visible as possible to the drivers while they approach to turn right because once they reach the intersection, they are unlikely to look to the right for pedestrians on the corner.

- Be prepared to alert the driver if the vehicle suddenly moves forward while you are in front of it, by hitting any part of the vehicle with your long cane.

For perpendicular traffic that is running the red light, pedestrians who are visually impaired should wait a few seconds after the walk phase begins, since most traffic that runs the red light does so within the first few seconds of the light turning red.

Strategies for crossing streets with stop signs

- Cross when there is no traffic at the intersection (for example, if you are relying on hearing, cross when there are no masking sounds and you hear no vehicles).

- Cross when the car in the nearest parallel lane is approaching too fast to turn (careful--this takes skill to do correctly, or you will actually increase your risk. For example, if you start to cross when the car has already entered the intersection, a left-turning vehicle may dart behind that car and cross your path without being able to see you crossing because the first car is blocking the driver's view of you).

Strategies at uncontrolled crossings

In situations in which the visually impaired person can see or hear the approaching traffic well enough to know that there is

a gap that is long enough to cross, the risks are negligible when he or she crosses during those gaps. The following strategies may be useful when teaching students to cross in situations in which it is not possible for them to see or hear the approaching traffic well enough to know that it is clear to cross:

- Be sure there is a good line of sight between you and the drivers.
- Be as visible as possible (for example, wear bright clothing; make the cane or dog harness visible; and at night, wear reflective arm or leg bands and carry a flashlight).
- Cross at times when there is less traffic (and therefore less likelihood that an undetected car will come just as you start to cross).
- Work with the traffic engineers to get the crossing well marked and well lit.
- Publicize the pedestrian laws and white cane laws in your community (be sure that you know these laws and work to revise them if needed).
- Work with the law enforcement community to have the pedestrian laws and white cane laws enforced.
- Try to make the public aware that blind people cross there regularly.

Decide if the risks are acceptable

Once the risks are identified and strategies for reducing them are considered, the O&M instructor should ask the student

(or his or her guardian, if appropriate) if the risk is acceptable for crossing when using the strategies to reduce the risk. It is important, when making the decision to cross, that the student be familiar with alternatives (see the next section). Sometimes travelers who are visually impaired who consider the risks to be acceptable will prefer alternatives that are less risky if they are aware of them.

Each person's acceptance of risk is individual and depends on such factors as the person's values, level of risk taking, and motivation. Although the decision of whether to accept the risk of crossing belongs to the student or his or her guardian, the O&M instructor is responsible for ensuring that the decision maker (the student or guardian) is aware of and fully understands the risks.

Consider alternatives

It is essential that the student is prepared and familiar with alternatives for situations in which the risk is not acceptable. No visually impaired traveler who has completed an O&M program should ever have to think, "I have no choice but to take the risk."

Not all of the following alternatives will be possible at every intersection, but there is always at least one alternative that is feasible, so that no visually impaired person ever has to make any crossing that has more risk than is acceptable. The alternatives for crossing alone at a given intersection are these:

- Get help (there are many creative ways to get help, including calling the destination for someone to come help you cross or getting drivers to pull over and help

you cross).

- Cross where you can hear better and you are more visible to the drivers or where the traffic is slower or the street is narrower.

- Cross at an intersection where there is better traffic control (a traffic signal or stop sign).

- Avoid the crossing (for instance, get a ride or use paratransit; if you are crossing to get to or from a bus stop, take the bus to the end of line and back; and if you are crossing to shop, have the food or merchandise delivered).

- If you are crossing at an uncontrolled street where you cannot hear or see the approaching traffic well enough, but you can hear or see far enough to know that it is clear to cross halfway (and if you know when you have crossed halfway and you are able to turn around and return to the curb), one alternative is to start to cross while you listen for approaching traffic, but turn around if you hear anything approaching before you reach the middle. If no traffic approaches until you reach the middle, complete the crossing.

- Ask the traffic engineer to alter the intersection (at signals, the timing can be extended, or a few seconds of a lead pedestrian interval with an accessible pedestrian signal can make the crossing much safer; at streets with no traffic control for the street being crossed, the street can be narrowed with bulbouts--extensions of the sidewalk into the street--and the traffic slowed with traffic-calming devices, or perhaps a stop sign or pedestrian bridge can be installed).

Conclusion

These guidelines are intended to help O&M specialists and their students overcome the challenges of street crossings at today's complex intersections. This approach has been successful in addressing concerns encountered in teaching a myriad of crossing situations to a variety of travelers of all ages, including those with additional disabilities.

References

Barlow, J. M., Franck, L., Bentzen, B. L., & Sauerburger, D. (2001). Pedestrian clearance intervals at modern intersections: Implications for the safety of pedestrians who are visually impaired. *Journal of Visual Impairment & Blindness, 95*, 663-667.

Barlow, J. M., Bentzen, B. L., & Tabor, L. (2003). *Accessible pedestrian signals: Synthesis and guide to best practice*. Berlin, MA: Accessible Design for the Blind.

Bentzen, B. L., Barlow, J. M., & Franck, L. (2000). Addressing barriers to blind pedestrians at signalized intersections. *ITE Journal, 70*(9), 32-35.

Carroll, J., & Bentzen, B. L. (1999). American Council of the Blind survey of intersection accessibility. *The Braille Forum, 38*, 11-15.

Frieswyk, J. (2005). Crossing strategy for modern signalized intersections. *AER Orientation and Mobility Division Newsletter, 11*(2), 16-17.

Jacobson, W. H. (1993). *The art and science of teaching orientation and mobility to persons with visual*

impairments. New York: AFB Press.

LaGrow, S. J., & Weessies, M. J. (1994). *Orientation and mobility: Techniques for independence.* Palmerston North, New Zealand: Dunmore Press.

Sauerburger, D. (1989). To cross or not to cross: Objective timing methods of assessing street crossings without traffic controls, *RE:view, 11,* 153-161.

Sauerburger, D. (1995). Safety awareness for crossing streets with no traffic control. *Journal of Visual Impairment & Blindness, 89,* 423-431.

Sauerburger, D. (1998). *Intersection design and street-crossing strategies for blind pedestrians: Then and now* [Videotape]. Gambrills, MD: Author.

Sauerburger, D. (1999). Developing criteria and judgment of safety for crossing streets with gaps in traffic. *Journal of Visual Impairment & Blindness, 93,* 447-450.

Sauerburger, D. (2003). Scanning for cars. *AER Orientation and Mobility Division Newsletter, 9*(2), 26.

Dona Sauerburger, COMS, *orientation and mobility specialist in private practice, 1606 Huntcliff Way, Gambrills, MD 21054; e-mail: <sauerburger@mindspring.com>.*

Previous Article | Next Article | Table of Contents

If you would like to give us feedback, please contact us at jvib@afb.net.

Please direct your comments and suggestions to afbinfo@afb.net